REMARKS/ARGUMENTS

The amendments to the claims are formal in nature and place them in better form. The amendment to Claim 3 is supported at specification page 4, lines 34-35. The new claims are supported by the original claims. No new matter has been added.

With regard to the objection to claims 4-9, the Examiner's attention is directed to the Preliminary Amendment filed June 5, 2002, removing the multiple dependencies from these claims. These amendments have been included in the above listing of amended claims.

The present invention relates to a process for recycling an article comprising vinyl chloride polymer and/or vinylidene chloride polymer where article fragments are brought into contact with an azeotropic or quasiazeotropic mixture of water and a dissolving solvent, followed by precipitation of the polymer from solution by the injection of steam. This injection of steam additionally results in the entrainment of the solvent-water azeotrope and leaves a mixture remaining which is essentially composed of water and solid polymer particles.

In general terms, the present invention process can be viewed as using an azeotropic or quasiazeotropic mixture[1] of water and a dissolving solvent as the "solvent," and steam as the "nonsolvent." The vinyl chloride and/or vinylidene chloride polymer is dissolved in the solvent, and precipitated therefrom upon introduction of the nonsolvent.

The applied prior art, Hafner (U.S. 3,836,486) relates to a vinyl chloride recovery process wherein scrap plastic is dissolved in a solvent and then agitated with a nonsolvent to precipitate, or recover, the vinyl chloride polymer. In this sense, the general outline of the process in Hafner is somewhat similar to that of the present invention: dissolution in a solvent followed by precipitation therefrom caused by introduction of a nonsolvent.

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[1] See the paragraph bridging pages 5 and 6 of the specification for a definition of the term "azeotropic or quasiazeotropic mixture."

However, Hafner neither discloses nor suggests the use of steam, or for that matter water in any form, as the nonsolvent.

In Hafner we are taught that "[w]ater should be excluded as much as possible from the system." See column 4, lines 18-19. Should any water be present, Hafner teaches us that it should be removed by distillation or drying prior to introduction into the system. In this regard, it is quite clear in Hafner that any water present in the "plastic feed" that has been removed, for example by azeotropic distillation, is removed prior to the plastic feed being introduced to the solvent/nonsolvent system. Hafner explains that water is undesirable because it will "seriously alter the rate of separation of the components [i.e., the solvent and nonsolvent], thus making the process uneconomical." See column 4, lines 21-24.

The Examiner has taken the position that the teaching in Hafner regarding the avoidance of water in the system means that water may be present in the plastic feed and that when the plastic is dissolved in the solvent a solvent/water mixture could be obtained, possibly suggesting the use in the present invention of an azeotropic or quasiazeotropic mixture. While Applicants submit that any water present in the plastic feed of Hafner would be insufficient to provide an azeotropic or quasiazeotropic mixture of water and a dissolving solvent, this issue can be put aside for the moment in view of perhaps an even greater difference between the present invention and Hafner: the use of steam in the present invention as the nonsolvent.

Hafner's processes is depicted in Figure 1 thereof and is succinctly summarized at column 2, lines 40-48:

> In summary, the invention is based on the discovery that valuable components of scrap plastic resulting from the manufacture of articles from vinyl chloride polymer may be separated by sequentially contacting the scrap plastic with a solvent for vinyl chloride polymer and a substantially non-aqueous non-solvent for the same, accompanied by appropriate separation and/or purification of the ingredients of the mixture. The solvent and non-solvent are selected from mutual miscibility.

Hafner's non-solvents are described at column 4, line 69ff and are described as "substantially non-aqueous." Examples are volatile organic liquids, admixtures thereof, and non-aqueous azeotropes thereof. See the paragraph bridging columns 4-5 of the reference. Methanol, isopropanol and n-butanol are suggested.

Where in Hafner is the suggestion to use steam as a nonsolvent? Hafner's nonsolvents are non-aqueous. Even if one were to consider Hafner's solvent to be an azeotrope or a quasiazeotrope, which Applicants submit is not, there is no suggestion in the reference that would guide one of ordinary skill in the art to use steam as the nonsolvent to cause precipitation of the recycled polymer. As noted in the paragraph bridging pages 8 and 9 of the specification, this use of steam has another benefit in addition to product precipitation. For example, at a given point in the process, by continuing to inject steam in the medium when there is not enough solvent to form an azeotrope the distillation curve (e.g., of a binary MEK-water medium) is followed and vapors which are richer and richer in water are generated, eventually providing a medium (and vapors) substantially free of solvent. Consequently, by collecting vapor during this process a medium which contains more water than the azeotrope is obtained and this medium, when it settles out, divides itself into two phases: one which has approximately the azeotropic composition, and one which is richer in water. Both of these phases can be reused in the main process. See, e.g., Claim 8.

Accordingly, and because Hafner neither discloses nor suggest the use of steam as a nonsolvent in the recovery of a vinyl chloride polymer, Applicants respectfully submit that the pending claims define patentable subject matter, and early notification to this effect is respectfully requested.

Respectfully submitted,

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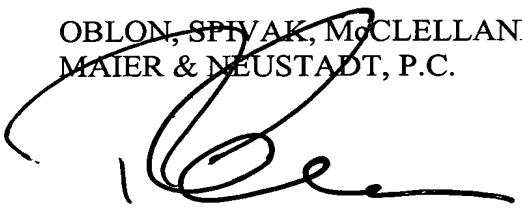

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